The invention in which an exclusive right is claimed is defined by the following:

1. A method for administering a medical agent to a patient, and then substantially removing excess medical agent from the patient, comprising the steps of:

(a) selecting a medical agent that is capable of inducing a desired effect in the patient;

(b) adding a magnetically sensitive material to the medical agent, producing a magnetically sensitive medical agent;

(c) administering the magnetically sensitive medical agent to the patient;

(d) enabling the magnetically sensitive medical agent to induce the desired effect in the patient; and

(e) removing the unused magnetically sensitive medical agent from the patient by:

(i) removing a portion of a bodily fluid from the patient, said bodily fluid carrying the unused magnetically sensitive medical agent;

(ii) magnetically filtering said portion of the bodily fluid to remove the magnetically sensitive medical agent, producing filtered bodily fluid;

(iii) returning the filtered bodily fluid to the patient; and

(iv) repeating steps (i)-(iii) until the unused magnetically sensitive medical agent has been substantially removed from the patient.

2. The method of Claim 1, wherein the step of enabling the magnetically sensitive medical agent to induce the desired effect in the patient comprising the step of concentrating the magnetically sensitive medical agent at a target location by allowing sufficient time to elapse for the magnetically sensitive medical agent to concentrate at the target location.

3. The method of Claim 1, wherein the step of administering the magnetically sensitive medical agent to the patient comprises the step of administering the magnetically sensitive medical agent by at least one of an intra-arterial injection and a retrograde venous injection.

4. The method of Claim 1, wherein the step of administering the magnetically sensitive medical agent to the patient comprises the step of administering the magnetically sensitive medical agent by at least one of implantation and orally.

5. The method of Claim 1, wherein the bodily fluid comprises blood, and the step of removing the portion of the bodily fluid, comprises the step of adding an anticoagulant to the blood.

6. The method of Claim 1, wherein the bodily fluid comprises at least one of a lymph fluid and a bile fluid.

7. The method of Claim 1, wherein the step of removing bodily fluid is executed as a substantially continuous process and includes the step of circulating the portion of the bodily fluid through an extracorporeal circuit.

8. The method of Claim 7, wherein the step of circulating the portion of the bodily fluid includes the step of pumping the bodily fluid.

9. The method of Claim 7, wherein the step of circulating a portion of the bodily fluid is facilitated using an arterial pressure.

10. The method of Claim 1, wherein the step of removing bodily fluid is executed as a batch process.

11. The method of Claim 10, wherein the batch process comprises the steps of:

(a) pumping a desired batch of the bodily fluid from the patient through a magnetic field;

(b) collecting the bodily fluid removed from the patient;

(c) magnetically filtering the batch of the bodily fluid to remove the magnetically sensitive medical agent, producing the filtered bodily fluid; and

(d) pumping the filtered bodily fluid back into the patient.

12. The method of Claim 1, further comprising the step of adding a polymer surface coating to the medical agent to increase an in vivo residence time of the medical agent.

13. The method of Claim 1, wherein when the medical agent comprises a radioactive material, further comprising the step of performing a whole body scan to determine a baseline measure of radioactivity within the patient, before the step of administering the magnetically sensitive medical agent.

14. A method for administering a targeted medical agent to a patient, such that the targeted medical agent is concentrated at a targeted location, and unused targeted medical agent is substantially removed from non-targeted locations within the patient, comprising the steps of:

(a) selecting a medical agent that is capable of inducing a desired effect at a targeted location in the patient;

(b) combining said medical agent with a targeting component, producing a targeted medical agent;

(c) adding a magnetically sensitive material to said combination, producing a magnetically sensitive targeted medical agent;

(d) administering the magnetically sensitive targeted medical agent to the patient;

(e) enabling the magnetically sensitive targeted medical agent to reach the targeted location; and

(f) removing the magnetically sensitive targeted medical agent from non-targeted portions within the patient by:

(i) removing a portion of a bodily fluid from the patient, said bodily fluid carrying the unused magnetically sensitive target medical agent through the non-targeted locations in the patient;

(ii) magnetically filtering said portion of the bodily fluid to remove the magnetically sensitive targeted medical agent, producing filtered bodily fluid;

(iii) returning the filtered bodily fluid to the patient; and

(iv) repeating steps (i)-(iii) until the unused magnetically sensitive targeted medical agent has been substantially removed from the non-targeted locations in the patient.

15. The method of Claim 14, further comprising the step of concentrating the magnetically sensitive targeted medical agent at the targeted location by allowing sufficient time to elapse for the magnetically sensitive targeted medical agent to concentrate at the targeted location.

16. The method of Claim 14, wherein the step of concentrating comprises the step of waiting at least four hours before initiating the step of removing the magnetically sensitive targeted medial agent from the non-targeted portions within the patient.

17. The method of Claim 14, wherein the step of administering the magnetically sensitive targeted medical agent to the patient comprises the step of administering the magnetically sensitive targeted medical agent by intravascular injection.

18. The method of Claim 17, wherein the step of administering the magnetically sensitive targeted medical agent by intravascular injection comprises the step of employing at least one of an intra-arterial injection and a retrograde venous injection.

19. The method of Claim 14, wherein the step of administering the magnetically sensitive targeted medical agent to the patient comprises the step of administering the magnetically sensitive targeted medical agent by implantation.

20. The method of Claim 14, wherein the step of administering the magnetically sensitive targeted medical agent to the patient comprises the step of administering the magnetically sensitive targeted medical agent orally.

21. The method of Claim 14, wherein the bodily fluid comprises blood.

22. The method of Claim 21, wherein the step of removing the portion of the bodily fluid, comprises the step of adding an anticoagulant to the blood.

23. The method of Claim 14, wherein the bodily fluid comprises at least one of a lymph fluid and a bile fluid.

24. The method of Claim 14, wherein the step of removing bodily fluid is executed as a substantially continuous process and includes the step of circulating the portion of the bodily fluid through an extracorporeal circuit.

25. The method of Claim 24, wherein the step of circulating the portion of the bodily fluid includes the step of pumping the bodily fluid.

26. The method of Claim 24, wherein the step of circulating a portion of the bodily fluid is facilitated using an arterial pressure.

27. The method of Claim 24, wherein the step of circulating a portion of the bodily fluid comprises the step of employing a flow rate of from about 150 to about 200 milliliters per minute.

28. The method of Claim 14, wherein the step of magnetically filtering the bodily fluid comprises the step of exposing the bodily fluid to a magnetic field for at least about five seconds.

29. The method of Claim 14, wherein the step of magnetically filtering the bodily fluid comprises the step of exposing the bodily fluid to a magnetic field such that a velocity of the bodily fluid through the magnetic field is less than about two centimeters per second.

30. The method of Claim 14, wherein the step of magnetically filtering the bodily fluid comprises the step of exposing the bodily fluid to a magnetic field such that a flow rate of the bodily fluid through the magnetic field is less than about 200 milliliters per minute.

31. The method of Claim 14, wherein the step of magnetically filtering the bodily fluid comprises the step of exposing the bodily fluid to a magnetic field such that a flow rate of the bodily fluid through the magnetic field is less than about 150 milliliters per minute.

32. The method of Claim 14, wherein the step of magnetically filtering the bodily fluid comprises the step of exposing the bodily fluid to a magnetic field having an intensity greater than about 0.1 Tesla.

33. The method of Claim 14, wherein the step of removing bodily fluid is executed as a batch process.

34. The method of Claim 33, wherein the batch process comprises the steps of:

(a) pumping a desired batch of the bodily fluid from the patient through a magnetic field;

(b) collecting the bodily fluid removed from the patient;

(c) magnetically filtering the batch of the bodily fluid to remove the magnetically sensitive targeted medical agent, producing the filtered bodily fluid; and

(d) pumping the filtered bodily fluid back into the patient.

35. The method of Claim 14, further comprising the step of adding a polymer surface coating to the medical agent to increase an in vivo residence time of the medical agent.

36. The method of Claim 14, wherein the step of combining comprises the step of limiting a size of the targeted medical agent to between about 60 and about 400 nanometers.

37. The method of Claim 14, further comprising the step of encapsulating the selected medical agent in a shell that is about 100 nanometers in size before the step of combining the medical agent with a targeting component.

38. The method of Claim 14, wherein when the targeting component comprises an antibody, further comprising the step of administering a test amount of the antibody alone to the patient, to determine if an allergic reaction occurs, before the step of administering the magnetically sensitive targeted medical agent.

39. The method of Claim 14, wherein when the medical agent comprises a radioactive material, further comprising the step of performing a whole body scan to determine a baseline measure of radioactivity within the patient, before the step of administering the magnetically sensitive targeted medical agent.

40. The method of Claim 14, wherein when the medical agent comprises a radioactive material, further comprising the step of performing a whole body scan to determine if sufficient radioactive material is concentrated at the target location to achieve a desired effect, before the step of removing the unused targeted medical agent.

41. The method of Claim 14, wherein the step of concentrating the magnetically sensitive targeted medical agent at the targeted location does not employ a magnetic field to concentrate the magnetically sensitive targeted medical agent at the targeted location.

42. A method for administering a medical agent to a patient, such that the medical agent is concentrated at a targeted location, but is substantially removed from non-targeted locations within the patient, comprising the steps of:

(a) selecting a medical agent that is capable of inducing a desired effect at the targeted location in a patient;

(b) combining said medical agent with a targeting component that preferentially is attracted to tissue at the targeted location, producing a targeted medical agent;

(c) adding a magnetically sensitive material to said targeted medical agent, producing a magnetically sensitive targeted medical agent;

(d) administering the magnetically sensitive targeted medical agent to a patient;

(e) concentrating the magnetically sensitive targeted medical agent at the targeted location; and

(f) removing the magnetically sensitive targeted medical agent from non-targeted portions of the patient to which it is systemically distributed, by:

(i) removing a portion of a bodily fluid from the patient, said bodily fluid conveying the magnetically sensitive targeted medical agent systemically within the patient;

(ii) magnetically filtering said portion of the bodily fluid to remove the magnetically sensitive targeted medical agent from said portion of the bodily fluid, producing filtered bodily fluid;

(iii) returning the filtered bodily fluid to the patient; and

(iv) repeating steps (i)-(iii) until the bodily fluid has been sufficiently filtered to substantially remove the magnetically sensitive targeted medical agent being systemically distributed within the patient.

43. A method for administering a medical agent to a patient, such that the medical agent is concentrated at a targeted location, but is substantially removed from non-targeted locations within the patient, comprising the steps of:

(a) selecting a medical agent that is capable of inducing a desired effect at a targeted location in the patient;

(b) producing a magnetically sensitive medical agent by combining said medical agent with a magnetically sensitive material;

(c) administering the magnetically sensitive medical agent to the patient;

(d) concentrating the magnetically sensitive medical agent at the targeted location, by providing a magnetic field adjacent to the targeted location, said magnetic field attracting the magnetically sensitive material of the magnetically sensitive medical agent to the targeted location; and

(e) removing the magnetically sensitive medical agent from non-targeted locations of the patient by:

(i) withdrawing a portion of a bodily fluid from the patient, said bodily fluid including the magnetically sensitive medical agent;

(ii) magnetically filtering said portion of the bodily fluid that has been withdrawn, to remove the magnetically sensitive medical agent from said portion of the bodily fluid producing filtered bodily fluid;

(iii) returning the filtered bodily fluid to the patient; and

(iv) repeating steps (i)-(iii) until the bodily fluid has been sufficiently filtered to substantially remove the magnetically sensitive medical agent being systemically distributed within the patient.

44. The method of Claim 43, further comprising the step of retaining at least a portion of said magnetically sensitive medical agent at the targeted location, by maintaining a magnetic field adjacent to the targeted location.

45. The method of Claim 44, wherein the magnetic field is maintained adjacent to the targeted location for as long as it is desirable for the magnetically sensitive medical agent to be retained at the target location.

46. The method of Claim 43, wherein the step of producing a magnetically sensitive medical agent comprises the step of by encapsulating said medical agent and said magnetically sensitive material within one of a liposome and a polymer shell.

47. The method of Claim 43, further comprising the step of coating said medical agent with a polymer that reduces an uptake of the medical agent by a reticuloendothelial system of the patient.

48. The method of Claim 43, wherein the step of withdrawing the portion of the bodily fluid comprises the step of removing the bodily fluid from a first location on the patient through a fluid line; wherein the step of magnetically filtering comprises the steps of pumping the bodily fluid that was removed into a collection reservoir, and exposing the bodily fluid to a magnetic filter; and wherein the step of returning the filtered bodily fluid to the patient comprises the step of pumping the filtered bodily fluid back through the fluid line and into the patient.

49. The method of Claim 48, wherein the step of withdrawing further comprises the step of controlling an amount of bodily fluid removed from the patient, so that only a desired amount is removed.

50. The method of Claim 43, wherein the step of withdrawing comprises the step of removing the portion of the bodily fluid from a first location on the patient through a first fluid line; and wherein the step of returning the filtered bodily fluid to the patient comprises the step of returning the filtered bodily fluid to a second location on the patient through a second fluid line.

51. The method of Claim 50, further comprising the step of employing a pump to drive the portion of the bodily fluid withdrawn and the filtered bodily fluid through the first and second fluid lines, respectively.

52. The method of Claim 50, further comprising the step of employing arterial pressure to drive the portion of the bodily fluid withdrawn and the filtered bodily fluid through the first and second fluid lines, respectively.

53. A method for reducing an amount of targeted medical agent systemically distributed in a patient, while enabling said targeted medical agent to be concentrated at a target location in the patient, comprising the steps of:

(a) administering targeted medical agent to the patient, said targeted medical agent comprising a medical agent, a magnetically sensitive component, and a targeting component; and

(b) extracorporeally magnetically filtering a bodily fluid withdrawn from the patient to reduce an amount of the targeted medical agent systemically distributed in the patient.

54. A method for reducing an amount of targeted medical agent systemically distributed in a patient, while enabling said targeted medical agent to concentrate at a target location in the patient, comprising the steps of:

(a) administering targeted medical agent to the patient, said targeted medical agent comprising a medical agent, a magnetically sensitive component, and a targeting component;

(b) allowing sufficient time to elapse for at least a portion of said targeted medical agent to become concentrated at the target location; and

(c) extracorporeally magnetically filtering a bodily fluid withdrawn from the patient to reduce an amount of targeted medical agent systemically distributed in the patient.

55. A system for reducing a systemic concentration of a medical agent in a patient, comprising:

(a) means for removing a bodily fluid from a patient, wherein said bodily fluid contains a medical agent that includes a magnetically attracted component;

(b) a fluid volume having an inlet and an outlet, said inlet and outlet being adapted to couple in fluid communication with a patient and to convey a bodily fluid from and to a patient; and

(c) a magnetic field generator disposed adjacent the fluid volume and thereby adapted to act on a bodily fluid removed from a patient that is contained within the fluid volume, said magnetic field generator producing a magnetic field adapted to attract a magnetically attracted component contained in a bodily fluid, so that a medical agent is filtered from a bodily fluid.

56. A system for reducing a systemic concentration of a medical agent in a patient, comprising:

(a) a fluid line adapted to couple in fluid communication with a patient, to enable a bodily fluid to be removed from a patient through said fluid line;

(b) means for magnetically filtering medical agent from a bodily fluid that has been removed from a patient, wherein the medical agent includes a component attracted to a magnetic field, said means for magnetically filtering comprising:

(i) a housing defining a fluid volume and having an inlet and an outlet, said inlet being coupled in fluid communication with said fluid line; and

(ii) a magnetic field generator disposed proximate to said fluid volume, producing a magnetic field that extends into said fluid volume; and

(c) a filtered fluid line in fluid communication with said outlet, said filtered fluid line being adapted to couple in fluid communication with a patent to return a filtered bodily fluid to a patient.

57. A system for administering a medical agent to a patient, such that a first portion of said medical agent is concentrated at a target location, and a second portion of said medical agent that is not disposed at the target location is substantially removed from the patient; comprising:

(a) a targeted medical agent comprising a therapeutic component, a targeting component that causes said targeted medical agent to be concentrated at a target location within a patient, and a magnetically sensitive component;

(b) means for administering said targeted medical agent to a patient;

(c) means for removing a bodily fluid from a patient, wherein said bodily fluid contains at least a portion of the targeted medical agent administered to a patient;

(d) a fluid line adapted to couple a patient in fluid communication with said means for removing a bodily fluid from a patient;

(e) means for magnetically filtering targeted medical agent from a bodily fluid withdrawn from a patient, said means for magnetically filtering comprising

(i) a fluid volume having an inlet and an outlet, said inlet being in fluid communication with said fluid line; and

(ii) a magnetic field generator disposed proximate said fluid volume and producing a magnetic field extending into said fluid volume, a strength of said magnetic field being sufficient to immobilize substantially all targeted medical agent within said fluid volume; and

(f) a filtered fluid line adapted to couple a patient in fluid communication with said outlet, to convey a magnetically filtered bodily fluid from which said targeted medical agent has been substantially removed, back into a patient.

58. The system of Claim 57, wherein said targeted medical agent further comprises at least one of a liposome, a protein, a lipid, a polymer, a peptide, a lipopolymer, a gas bubble, a biological cell, a virus, a bacteria, a prion, an antibody, an antigen, a hydrogel, and a dendrimer.

59. The system of Claim 57, wherein said means for administering said targeted medical agent to a patient comprises one of a syringe, a pump, an administration set utilizing gravity flow, and an implanted device.

60. A system for reducing a systemic concentration of a medical agent incorporating a magnetically sensitive component in a patient, comprising:

(a) a first fluid line adapted to couple in fluid communication with a patient, such that a bodily fluid can be removed from a patient through said first fluid line;

(b) means for magnetically filtering the medical agent from a bodily fluid, said means for magnetically filtering comprising:

(i) a fluid volume having an inlet and an outlet, said inlet being in fluid communication with said first fluid line; and

(ii) a magnetic field generator disposed proximate to said fluid volume, producing a magnetic field substantially extending into said fluid volume, a strength of said magnetic field being sufficient to immobilize substantially all medical agent conveyed by a bodily fluid into said fluid volume, producing a filtered bodily fluid;

(c) a second fluid line in fluid communication with said outlet;

(d) a fluid reservoir for temporary storage of the filtered bodily fluid; and

(e) a pump operatively coupled to one of said first and second fluid lines, said pump withdrawing a bodily fluid from a patient through said fluid volume and into said fluid reservoir, and drawing filtered bodily fluid from said fluid reservoir for return to a patient.

61. A system for reducing a systemic concentration of a medical agent in a patient, said medical agent being attracted to a magnetic field, comprising:

(a) means for removing a bodily fluid from a patient, wherein said bodily fluid contains at least a portion of a medical agent in a patient;

(b) a magnetic filter for magnetically filtering the medical agent from a bodily fluid that has been withdrawn from a patient, said magnetic filter comprising:

(i) a magnetic separator chamber comprising a generally annular volume defined between a generally cylindrical inner component and a generally cylindrical outer component, said generally annular volume having a fluid inlet and a fluid outlet, said fluid inlet and said fluid outlet being generally disposed at opposing ends of said generally annular volume and in fluid communication with said means for removing a bodily fluid; and

(ii) a magnetic field generator disposed adjacent to said generally annular volume and producing a magnetic field having an intensity of about at least 0.1 Tesla within said annular volume, said magnetic field filtering the medical agent from the bodily fluid, producing a magnetically filtered bodily fluid; and

(c) means for returning a magnetically filtered bodily fluid to a patient, wherein such a magnetically filtered bodily fluid contains substantially less medical agent than was present in an unfiltered bodily fluid removed from a patient.

62. The system of Claim 61, wherein said magnetic field generator comprises a plurality of elongate magnets disposed in a spaced-apart array about an outer surface of said generally cylindrical outer component, adjacent magnets having a different pole oriented towards said generally annular volume, such that said generally annular volume is exposed to a magnetic field extending between the different poles.

63. The system of Claim 62, wherein said magnetic field generator further comprises a flux coupler that enhances a magnetic flux directed toward said generally annular volume.

64. The system of Claim 61, wherein said fluid inlet and fluid outlet are disposed generally at opposite ends of said magnetic filter.

65. The system of Claim 61, wherein a diameter of at least one of said generally cylindrical inner component and said generally cylindrical outer component varies along its longitudinal axis, such that a spacing between said generally cylindrical inner component and said generally cylindrical outer component is larger adjacent said inlet than adjacent to said outlet, so that particles comprising the medical agent that immobilized by said magnetic filter do not accumulate within the annular volume sufficiently to block said inlet.

66. A magnetic filter capable of immobilizing a magnetically attracted material entrained in a fluid, comprising:

(a) a magnetic separator chamber comprising a generally annular volume defined between a generally cylindrical inner component and a generally cylindrical outer component, said generally annular volume comprising a fluid inlet and a fluid outlet, said fluid inlet and said fluid outlet being generally disposed at opposite ends of said magnetic separator chamber; and

(b) a magnetic field generator disposed adjacent to said magnetic separator chamber, such that said generally annular volume is exposed to a magnetic field produced by the magnetic field generator, immobilizing any magnetically attracted material entrained in a fluid flowing through the annular volume.

67. The magnetic filter of Claim 66, wherein said magnetic field generator is capable of producing a magnetic field of at least about 0.1 Tesla within said generally annular volume.

68. The magnetic filter of Claim 66, wherein said magnetic field generator is disposed adjacent an outer surface of said generally cylindrical outer component.

69. The system of Claim 66, wherein said magnetic field generator comprises a plurality of elongate magnets disposed in a spaced-apart array adjacent to said magnetic separator chamber, adjacent magnets having a different pole oriented towards said generally annular volume.

70. The system of Claim 69, wherein said magnetic field generator further comprises a flux coupler that enhances a magnetic flux directed toward said generally annular volume.

71. The system of Claim 66, wherein said magnetic field generator exposes said generally annular volume to a magnetic field.

72. The system of Claim 66, wherein at least one of said fluid inlet and fluid outlet comprises a fluid channel disposed along a central axis of said generally cylindrical inner component.

73. The system of Claim 66, wherein a diameter of at least one of said generally cylindrical inner component and said generally cylindrical outer component varies along its longitudinal axis, such that a spacing between said generally cylindrical inner component and said generally cylindrical outer component is larger adjacent said fluid inlet than adjacent to said fluid outlet, so that the magnetically attracted material that is immobilized by said magnetic field does not accumulate sufficiently to block said inlet.